Journal of Educational Psychology
2015, Vol. 107, No. 3, 842–854


0022-0663/15/$12.00 http://dx.doi.org/10.1037/edu0000002

# Do Grades Shape Students' School Engagement? The Psychological Consequences of Report Card Grades at the Beginning of Secondary School

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Receiving report card grades is psychologically salient to most students and can elicit a range of affective reactions. A 3-wave longitudinal study examined how grades shape students' ($N$ = 375; $M$ age at Wave 1 = 12.6 years) school engagement through the affective reactions they elicit. Emotional and behavioral engagement were measured at the start of secondary school and 6 months later. Halfway through this period, students' positive and negative affective reactions to their 1st report card in secondary school were assessed. As expected, lower report card grades predicted lower emotional and behavioral engagement in spring, when controlling for prior levels of engagement. These links were mediated by students' affective reactions. Boys and children who perceived the performance norms in their class to be high were more affectively reactive to their grades, which resulted in a stronger indirect effect of grades via negative affect on emotional engagement. Complementing the traditional view that grades are *consequences* of school engagement, the current findings suggest that grades function also as antecedents of school engagement.

*Keywords:* school engagement, positive and negative affect, grades, school transition, school performance



Throughout the world, students typically receive grades as an evaluation of their school work. Grades are not only a form of feedback on past performance, they also impact subsequent academic trajectories by determining whether students graduate from one grade to the next, and what level of course work (e.g., low or high academic track) is available to them. Given the importance of grades, it is not surprising that they can trigger a range of affective reactions, from excitement and pride to distress and shame (Crocker, Karpinski, Quinn, & Chase, 2003; Goldstein & Strube, 1994; Kluger & DeNisi, 1996). Grades and the affective reactions they evoke likely affect how much time and effort students invest in their subsequent work. Although at times teachers may expect that low grades urge students to put more effort in their school work (Kohn, 1994), there is some empirical research suggesting that it may be high rather than low grades that are more effective in increasing student effort (You & Sharkey, 2009) and interest in the subject matter (Butler, 1988; Denissen, Zarrett, & Eccles, 2007; Shim & Ryan, 2005). Thus, the motivational effects of grades may differ from their presumed effects, possibly in part because of the motivational consequences of the affective reactions they evoke.

How grades shape students' school engagement through the affective reactions they elicit is the question addressed in the current study. In spite of a growing body of research showing that achievement-related emotions (e.g., anxiety, pride) play an important role in student learning (Linnenbrink-Garcia & Pekrun, 2011), there is paucity of research linking grades, affective reactions, and student engagement. Research on such interconnections may be

This article was published Online First October 27, 2014.

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This research was supported by a grant from the Jo Kolk Stichting and a Utrecht University Travel Grant.

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especially informative at critical time points, such as after the transition from primary school to secondary school,[1] when students are uncertain about how their academic competencies and performance will match up to what is expected from them (Harter, Whitesell, & Kowalski, 1992). Research shows that students' grades tend to fall off in sixth grade (i.e., the first year after the school transition in the United States), possibly because of stricter grading compared to primary school (Barber & Olsen, 2004; Eccles et al., 1993; Zanobini & Usai, 2002). At the same time, school engagement also declines for many students (Eccles et al., 1993; Fredricks & Eccles, 2002; Maulana, Opdenakker, Stroet, & Bosker, 2012). We propose that students' affective reactions to grades might help explain how and why grades impact subsequent student engagement.

## School Engagement

School engagement—students' active involvement in school based activities (Fredricks, Blumenfeld, & Paris, 2004; Skinner, Furrer, Marchand, & Kindermann, 2008)—is one of the strongest predictors of academic success and failure, including school dropout, retention, and achievement (Alexander, Entwisle, & Horsey, 1997; Connell, Spencer, & Aber, 1994; Fredricks et al., 2004). Two overlapping but empirically distinguishable components of school engagement are behavioral engagement and emotional engagement (Li & Lerner, 2011; Fredricks et al., 2004). Behavioral engagement refers to overt behavior, such as active class participation, effort and attention during classroom activities (Skinner et al., 2008), whereas emotional engagement more strongly refers to psychological experience, such as interest, enthusiasm, and (lack of) boredom (Skinner et al., 2008).[2] Most students show decreases in both behavioral and emotional engagement from childhood into adolescence, with the steepest decline after the transition from primary to secondary school (i.e., in sixth grade; Eccles et al., 1993; Fredricks & Eccles, 2002). Yet such decreasing trajectories are not universal (e.g., Li & Lerner, 2011), and so research on the processes that might help account for engagement at the beginning of secondary school is critical.

There are some initial indications that grades may help understand changes in student engagement. In a longitudinal study among adolescents (You & Sharkey, 2009), grades were a better predictor of change in behavioral engagement over time than were other relevant variables (including parental expectations, parent–child communication, locus of control, self-concept, peer academic value, whether a friend dropped out of school, and college aspirations), with higher grades predicting increased behavioral engagement. Grades have also been related to changes in emotional engagement. For example, college students who received high grades showed increased emotional engagement over the course of a semester (Shim & Ryan, 2005). Other studies in both primary and secondary school have demonstrated concurrent positive associations between students' grades and their behavioral and emotional engagement (e.g., Marks, 2000; Skinner, Wellborn, & Connell, 1990; Trautwein, Lüdtke, Marsh, Koller, & Baumert, 2006).

## Role of Affective Reactions

What could be the mechanism through which grades influence school engagement? Motivational theories, such as expectancy-value theory (Wigfield & Eccles, 2000) and self-efficacy theory (Bandura, 1977) highlight the role of cognitive processes as predictors of school engagement. In addition, grades may elicit powerful emotions (Crocker et al., 2003; Goldstein & Strube, 1994; Kluger & DeNisi, 1996). These affective processes have received far less attention to date (Linnenbrink-Garcia & Pekrun, 2011).

The present study aims to address this knowledge gap by testing the proposition that grades predict school engagement through the positive and negative affective reactions they elicit. *Positive* affect (Watson, Clark, & Tellegen, 1988) captures arousing pleasant and alert mood states, such as excitement, enthusiasm, and pride. Lack of positive affect is characterized by lethargy. *Negative* affect, on the other hand, captures arousing aversive mood states, such as distress, shame, and fear. Lack of negative affect is characterized by calmness (Watson et al., 1988). Previous research has established that positive and negative affect are relatively independent affect dimensions that only are moderately negatively correlated (Goldstein & Stube, 1994; Tellegen, Watson, & Clark, 1999).

Positive and negative affect are theorized to be part of two general affective activation systems—an approach system and a withdrawal system (Watson, Wiese, Vaidya, & Tellegen, 1999). Positive affect is theorized to be part of a larger motivational system of approach tendencies (Watson et al., 1999). As such, the positive affective reactions that result from high grades are expected to facilitate school engagement, both its emotional and behavioral manifestations. Although this link has not yet been tested in the context of receiving grades, previous empirical work on positive affect in other academic contexts (e.g., during group work and while making homework) is consistent with such a view (Efklides & Petkaki, 2005; Linnenbrink-Garcia, Rogat, & Koskey, 2011; Pekrun, Goetz, Frenzel, Barchfeld, & Perry, 2011; Pekrun, Goetz, Titz, & Perry, 2002).

Negative affect is theorized to be part of a larger motivational system of withdrawal tendencies that help people to avoid aversive stimuli (Watson et al., 1999). Predictions for negative affect may be different for emotional and behavioral engagement. Negative affect tends to be incompatible with feelings of enjoyment and interest (Pekrun et al., 2002). It is therefore likely that the negative affective reactions that result from low school grades will compromise students' emotional engagement—their interest and enjoyment during classroom activities. Indeed, some prior studies have found that negative affect is associated with lower emotional engagement (e.g., Martin, 2011; Pekrun et al., 2002).

Regarding behavioral school engagement, we propose that negative affect may have ambivalent effects. Negative affect may be an impetus to withdraw from the situation that caused the negative feelings (Watson et al., 1999). As students are obliged to attend school, they may not be able to withdraw from the situation physically but may withdraw psychologically, such as by decreasing the effort they invest in their schoolwork. Consistent with that

[1] In the Dutch school system, students make the transition from primary school into secondary school between sixth and seventh grade, at the age of 12.

[2] An additional component of engagement (not considered in the present study) is cognitive engagement (e.g., Fredrick et al., 2004). An alternative model of student engagement by Pekrun and Linnenbrink-Garcia (2012) distinguishes five components: cognitive, motivational, behavioral, cognitive behavioral, and social-behavioral engagement.

view, negative affect has been specifically linked to lower behavioral engagement in some previous studies (Dettmers et al., 2011; Linnenbrink-Garcia et al., 2011). However, negative affect may be motivating some students to overcome an aversive state and avoid future failure by investing *extra* effort in their schoolwork (Pekrun et al., 2002; Pekrun & Linnenbrink-Garcia, 2012). Indeed, some studies have shown that negative feelings, including anxiety and shame, sometimes encourage people to try harder in both academic and nonacademic domains (Eysenck, Derakshan, Santos, & Calvo, 2007; Martin, 2011; Tangney & Dearing, 2003; Tulis & Fulmer, 2013; Turner & Schallert, 2001). Given these mixed findings, we did not predict main effects of negative affect on behavioral engagement.

## Moderating Factors: Performance Norms and Gender

Students do not receive their grades in a social vacuum but are likely to compare their performance to the performance of their classmates (Pulfrey, Buchs, & Butera, 2011; Trautwein et al., 2006). Hence, when considering affective reactions to grades and how these predict subsequent engagement, it is important to consider students' perceptions of the performance norms in their classroom—i.e., what grades they think their classmates on average obtain. Prior research suggests that adolescents are particularly prone to adapt to peer academic norms shortly after the secondary school transition (Masten, Juvonen, & Spatzier, 2009; Molloy, Gest, & Rulison, 2011). Thus, when students perceive performance norms in their classroom to be high, they may hold higher standards for their own performance as well. Consequently, report card grades may elicit stronger affective reactions in students who perceive the norms in their class to be high than in students who perceive the performance norms in their class to be low.

When studying affective reactions to receiving grades and school engagement, it is also important to consider possible gender differences. Numerous studies have shown that compared to adolescent boys, adolescent girls typically obtain higher school grades (e.g., Duckworth & Seligman, 2006; Hendriks, Kuyper, Lubbers, & van der Werf, 2011; Lam et al., 2012; Wampler, Munsch, & Adams, 2002) and also report higher levels of school engagement (e.g., Lam et al., 2012; Li & Lerner, 2011; Marks, 2000; Rozendaal, Minnaert, & Boekaerts, 2001; Wang, Willett, & Eccles, 2011). Studying children's affective reactivity and subsequent engagement following the reception of grades could provide some insights into these gender differences. Given that boys are usually somewhat less emotionally reactive than girls (e.g., Charbonneau, Mezulis, & Hyde, 2009; Rudolph, 2002), it may be that boys will experience weaker affective reactions than girls in response to their grades. On the other hand, adolescent boys tend to be more competitive than adolescent girls (e.g., Gneezy & Rustichini, 2004; Hibbard & Buhrmester, 2010), and so another possibility is that they experience *stronger* affective reactions to grades. In the present study, these two different possibilities regarding the moderating role of gender are explored.

## Present Study

To study the effects of grades on affect and engagement, we conducted a three-wave longitudinal study among Dutch young adolescents who just made the transition to secondary school. A conceptual model of the study is provided in Figure 1. We studied students' affective reactions to their first report card and subsequent engagement during the first semester in secondary school. In the Dutch secondary school system, students are grouped into different academic tracks, ranging from practical training to preuniversity education (for a more detailed account of the Dutch school system, see Hendriks et al., 2011). Placement with a more academically homogeneous group of classmates may change the relative position of children in the peer group and the grades they receive. Therefore, during the first semester in secondary school, report card grades might have particularly strong psychological impact.

The first aim of the present study was to examine whether students' report card grades predict later school engagement. We hypothesized that higher report card grades predict higher levels of both emotional and behavioral engagement, even when controlling for levels of school engagement at the start of the school year (Hypothesis 1; Shim & Ryan, 2005; You & Sharkey, 2009).

The second aim of the study was to examine whether the presumed link between report card grades and school engagement is mediated by the positive and negative affective reactions that grades trigger. We predicted that higher report card grades will induce positive affective reactions, which in turn predict higher engagement (Hypothesis 2; Watson et al., 1999; Pekrun & Linnenbrink-Garcia, 2012). Furthermore, we predicted that higher report card grades will reduce negative affective reactions, which in turn predict higher emotional engagement (Hypothesis 3; Pekrun et al., 2002). In light of the mixed findings and theorizing on the effects of negative affect on behavioral engagement (Pekrun & Linnenbrink-Garcia, 2012; Watson et al. 1999), we did not formulate any directional hypotheses regarding this link.

The third aim of the study was to examine whether the presumed mediation of positive and negative affect will be moderated by students' perceptions of the performance norms in their classroom. We predicted that higher performance norms would strengthen the link between students' grades and their affective reactions. This stronger link, in turn, would result in larger indirect effects of grades on engagement via affective reactions (Hypothesis 4; i.e., moderated mediation, see Hayes, 2013; Preacher, Rucker, & Hayes, 2007). Finally, we explored whether gender moderates the link between grades and affective reactions.

The present study extends past research in important ways. First, it contributes to the relatively recent field of research on emotional aspects of learning and achievement in educational contexts (Linnenbrink-Garcia & Pekrun, 2011) by examining affective reactions to report card grades. Second, whereas school engagement has been typically examined as an antecedent of school performance, we now examine school engagement as a *consequence* of school performance. In doing so, we focus on a particularly meaningful phase in students' academic careers: their first semester in secondary school, a time marked by normative declines in school engagement (You & Sharkey, 2009). Third, this study examines underlying mechanisms that can explain how report card grades are linked with school engagement. To our knowledge, this study is the first to test empirically how affective reactions mediate the link between grades and school engagement. Fourth, we examine performance norms—an important aspect of the peer context in which students receive their grades—as a putative moderator,

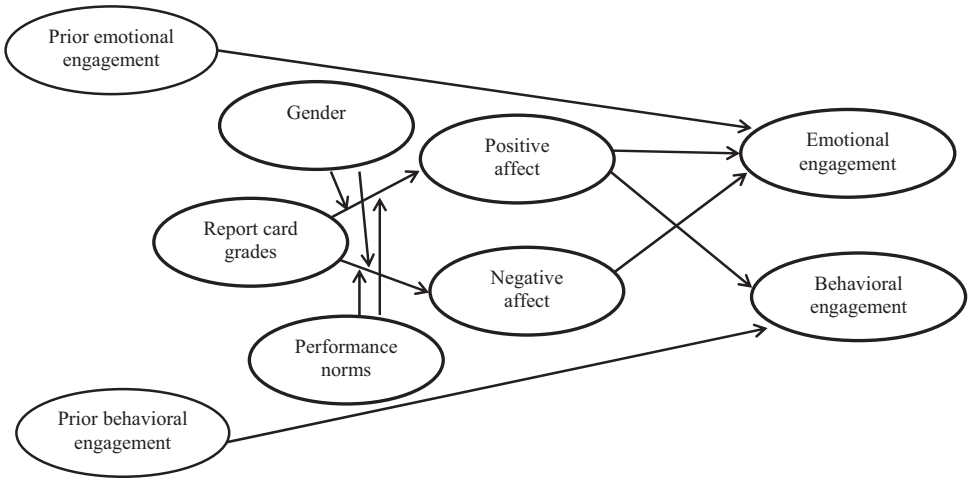


*Figure 1.* Conceptual model of the links between report card grades and school engagement via affective reactions, controlling for prior levels of engagement. The links between grades and affective reactions are predicted to be moderated by performance norms and gender.



thereby improving our understanding of peer influence on the psychological impact of grades.

## Method

### Participants

We conducted a three-wave longitudinal study among 438 Dutch seventh graders (53% girls) recruited from 19 classrooms in three secondary schools. As is common in the Dutch school system, the students transitioned into secondary school between sixth and seventh grade.

Participants were 11 to 14 years old ($M_{age}$ = 12.6, $SD$ = 0.4) at the start of the study. Most participants (87%) were of Dutch origin, 3% of Moroccan origin, and 2% of Turkish origin; others (8%) were mainly of mixed cultural/ethnic origin. Nationwide 80% of the inhabitants of the Netherlands are of Dutch origin, indicating that there was a slight overrepresentation of this group in our sample. Informed parental consent was obtained for all participants. Consent rates ranged from 73% to 100% across classrooms ($M_{consent\ rate}$ = 84%).

### Procedure

Surveys were administered in students' classes at three time points. We measured students' emotional and behavioral engagement at Time 1 (September, 2 to 3 weeks after the secondary school transition) and Time 3 (March). Students' affective reactions to their first report card and performance norms were measured at Time 2 (early in December, 2 to 3 weeks after they received their first report card).

### Measures

**Emotional and behavioral engagement (Time 1 and Time 3).** School engagement was measured using the Engagement Versus Disaffection With Learning Scale (Skinner et al., 2008) both at the start of the school year (September) and 6 months later (March). This scale consists of four subscales (behavioral engagement, behavioral disaffection, emotional engagement, and emotional disaffection). We aggregated the positive and negative emotional subscales and the positive and negative behavioral subscales (engagement and disaffection) by reverse coding when appropriate. The resulting 10-item *emotional* engagement scale measured students' emotional involvement during learning activities (e.g., "I enjoy learning new things in class"; "When we work on something in class, I feel bored"). The 10-item *behavioral* engagement scale measured students' effort, attention, and persistence during classroom activities (e.g., "When I am in class, I listen very carefully"; "I don't try very hard in school"). Items were rated on a 4-point scale (1 = *not at all true*; 4 = *completely true*). Cronbach's alpha was .77 (Time 1) and .79 (Time 3) for behavioral engagement and .77 (Time 1) and .78 (Time 3) for emotional engagement.

**Report card grades.** Report card grades for six main academic subjects (i.e., Dutch, English, math, biology, history, and geography) were retrieved from school records. In the Dutch school system, grades range from 1 (*extremely low*) to 10 (*extremely high*). A grade below 5.5 is considered a failing grade. Cronbach's alpha was .75.

**Affective reactions to report card grades (Time 2).** Participants' affective reactions to their report card grades were measured using the Positive Affect and Negative Affect Schedule (Watson et al., 1988). The 10-item *positive* affect subscale captures positive, active and alert mood states (e.g., interested, attentive, proud). The 10-item *negative* affect subscale captures a range of activating aversive mood states (e.g., upset, ashamed, irritable). Participants were asked to rate on a 5-point scale (1 = *very slightly or not at all*; 5 = *very much*) to what extent they had experienced each mood state the moment they saw their report card for the first time. Cronbach's alpha was .94 for positive affect and .91 for negative affect. The correlation between both scales was significant ($r = -.29$, $p < .001$), but moderate.

**Performance norms (Time 2).** Performance norms were measured by asking participants to estimate the grades that each individual classmate received; a direct measure of how students expect others to perform. Ratings were given on a 5-point scale (1 = *receives very low grades*; 5 = *receives very high grades*). A performance norm score was computed for each participant, by averaging the ratings he or she gave (number of ratings ranged from 19 to 31 across classrooms, $M_{\text{number of ratings}} = 27$).

## Statistical Analyses

We used structural equation modeling in Mplus 7.11 (Muthén & Muthén, 1998–2012) to analyze our data. Emotional engagement, behavioral engagement, report card grades, positive affect, and negative affect were modeled as latent variables. As recommended by Little (2013, p. 24), for each latent variable, items were assigned to three parcels (i.e., packages of several items) using a balancing approach (i.e., assigning the item with the highest item-scale correlation to be paired with the item with the lowest item-scale correlation in Parcel 1, the items with the next highest and lowest item-scale correlation in Parcel 2, etc.). For emotional and behavioral engagement, the same parcels were used at Time 1 and Time 3 (item-scale correlations were averaged across time to create the ranking of the items).[3] Performance norms constituted an observed variable. A latent variable with one indicator was created for this observed variable to facilitate latent variable interaction analyses and to take cases with missing data on performance norms into account (Muthén & Muthén, 1998–2012). The residual variance of the indicator was fixed at a small value of 0.01 to overcome identification problems (Barendse, Oort, Werner, Ligtvoet, & Schermelleh-Engel, 2012).

First, we examined the direct effect of report card grades on emotional and behavioral engagement. Second, positive and negative affective reactions to grades were considered as mediators of the link between grades and engagement. Third, we tested whether the mediation through positive and negative affect was moderated by performance norms and gender. In all models, we controlled for levels of emotional and behavioral engagement at the start of the school year. By modeling prior levels of engagement, change variance in engagement was isolated such that the predictive strength of grades and affective reactions on change in engagement could be examined (Little, 2013, p. 293). Importantly, this kind of modeling concerns rank-order (i.e., between-person) change, not intraindividual (i.e., within-person) change. This means that we examined individual differences in engagement in spring that were not present at baseline. The dependent variables were allowed to correlate.

Strict measurement invariance was found for emotional and behavioral engagement over time: differences between comparative fit indexes (ΔCFIs) for the unconstrained model, the weak invariant model, the strong invariant model, and the strict invariant models were smaller than 0.01 (see Appendix; Cheung & Rensvold, 2002). The measurement model including report card grades and emotional and behavioral engagement (Times 1 and 3) showed acceptable fit, $\chi^2(88, N = 436) = 170.3$, CFI = 0.97, root-mean-square error of approximation (RMSEA) = .046, 90% confidence interval (CI) for RMSEA [.036; .057]. The same was true for the measurement model to which positive and negative affect were added, $\chi^2(176, N = 438) = 373.29$, CFI = 0.96, RMSEA = .051, 90% CI for RMSEA [.043; .058].

Some data were missing at each measurement occasion: 3% at Time 1, 7.5% at Time 2, 3.5% at Time 3, and 7% for grades. The percentage of missing data for each variable ranged between 3% and 7.5%. Full information maximum likelihood was used to handle these missing values.

Because of the nested structure of the data (students in classrooms), we computed intraclass correlations (ICCs) to assess the degree to which students within classrooms are more similar to each other than children between classrooms. All ICCs were very low—i.e., 0.014 for negative affect, 0.008 for positive affect, 0.001 for emotional engagement (Time 3), and 0.000 for behavioral engagement (Time 3)—indicating that the effects of nestedness were very small. Because of the low ICCs, we analyzed all of the data together, collapsing across classrooms.

# Results

## Preliminary Analyses

Table 1 shows the descriptive statistics and correlations among the measured study variables. The average report card grade was 7.2 on a 1–10 scale, which is equivalent to an A−/B+ in the American school system (Netherlands Organisation for International Cooperation in Higher Education, 2011). As expected, report card grades were related to both positive and negative affective reactions to grades, and to emotional and behavioral engagement. Although emotional and behavioral engagement were relatively strongly correlated ($r = .61$ at Time 1 and $r = .68$ at Time 3), they did not perfectly overlap so it seemed justified to examine their affective correlates separately for conceptual reasons.

Analyses comparing boys' and girls' report card grades and affective reactions to grades revealed two gender differences. On average, girls obtained higher grades than boys, $t(420) = -3.44$, $p < .01$, $d = -0.34$. Also, girls experienced less negative affect in response to their grades than boys, $t(314.5) = 2.75$, $p < .01$, $d = 0.27$, but there were no differences in positive affect, $t(418) = -1.04$, $p = .30$.

A 2 (Time) × 2 (Gender) repeated measures analysis of variance (ANOVA) with emotional engagement as dependent variable showed that emotional engagement decreased over the course of the first year in secondary school, $F(1, 407) = 41.37$, $p < .001$. This main effect, however, was qualified by a Time × Gender interaction, showing that emotional engagement decreased more strongly for boys than for girls, $F(1, 407) = 6.86$, $p < .01$. A similar repeated-measures ANOVA showed that behavioral en-

[3] It has been argued that the use of parcels has several advantages over the use of items, including a higher reliability and a lower likelihood of distributional violations (Little, 2013; Little, Rhemtulla, Gibson, Schoemann, 2013). Parceling has recently also been criticized by Marsh, Lüdtke, Nagengast, Morin, and Von Davier (2013) because it can camouflage sources of misfit if the constructs are not unidimensional, which is especially problematic if the focus is on scale construction, latent means, measurement invariance, and differential item functioning. This was not the case in the present study. Furthermore, exploratory factor analyses showed that the constructs were relatively unidimensional with mean factor loadings ranging from .58 to .84.

Table 1
*Means, Standard Deviations, and Intercorrelations for the Study Variables*

| Variable | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Emotional engagement (T1) | 3.25 | 0.39 | — | | | | | | |
| 2. Behavioral engagement (T1) | 3.19 | 0.41 | .61** | — | | | | | |
| 3. Mean report card grade | 7.16 | 0.75 | .11* | .12* | — | | | | |
| 4. Positive affective reactions (T2) | 3.17 | 0.94 | .28** | .26** | .49** | — | | | |
| 5. Negative affective reactions (T2) | 1.44 | 0.61 | −.17** | −.15** | −.49** | −.29** | — | | |
| 6. Performance norms (T2) | 3.23 | 0.32 | .08 | .00 | −.13* | .09 | .11* | — | |
| 7. Emotional engagement (T3) | 3.12 | 0.40 | .50** | .38** | .23** | .34** | −.31** | .09 | — |
| 8. Behavioral engagement (T3) | 3.03 | 0.44 | .40** | .60** | .19** | .32** | −.17** | .05 | .68** |

*Note*. T1 = Time 1; T2 = Time 2; T3 = Time 3.
* $p < .05$. ** $p < .001$.



gagement also decreased over time, $F(1, 407) = 68.74$, $p < .001$. No gender differences were found for behavioral engagement ($ps > .20$).

## Grades Predicting School Engagement

First, we examined whether report card grades predict emotional and behavioral engagement at Time 3 (spring), when controlling for levels of emotional and behavioral engagement at Time 1 (fall). All variables were modeled as latent constructs. Overall, the model demonstrated acceptable fit, $\chi^2(88, N = 436) = 170.4$, CFI = 0.969, RMSEA = .046, 90% CI for RMSEA [.036; .057].

Emotional engagement in spring was predicted by initial level of emotional engagement, $b = 0.51$, $\beta = .51$, $SE = .12$, $p < .001$, but not by initial levels of behavioral engagement, $b = 0.06$, $\beta = .06$, $SE = .12$, $p = .60$. Similarly, behavioral engagement in spring was predicted by initial levels of behavioral engagement, $b = 0.87$, $\beta = .79$, $SE = .12$, $p < .001$, but not by initial levels of emotional engagement, $b = -0.16$, $\beta = -.15$, $SE = .12$, $p = .17$. More important, report card grades predicted both emotional engagement and behavioral engagement above and beyond prior levels of engagement, $b = 0.19$, $\beta = .19$, $SE = .06$ $p < .001$ and $b = 0.15$, $\beta = .13$, $SE = .06$, $p < .05$, respectively. Thus, consistent with Hypothesis 1, higher grades predicted increased emotional and behavioral engagement over the course of the first school year.

## Mediation Analyses

Next, it was examined whether positive and negative affective reactions mediated the link between report card grades and school engagement (see Figure 2 and Table 2). Because of the affective nature of both emotional engagement and affective reactions, emotional engagement at Time 1 was included as a predictor of positive and negative affect. The final model demonstrated acceptable fit, $\chi^2(179, N = 438) = 375.6$, CFI = 0.963, RMSEA = .050, 90% CI for RMSEA [.043; .057].

Bootstrapping procedures were used to examine whether the indirect effects through positive and negative affect were significant (see Preacher & Hayes, 2008). In bootstrapping, a large number of bootstrap samples (in the present analyses, $B = 5{,}000$) are generated from the original data set. For each bootstrap sample, the indirect effects (i.e., mediated effects) of report card grades on engagement through positive and negative affective reactions were computed. The distribution of these indirect effects was then used

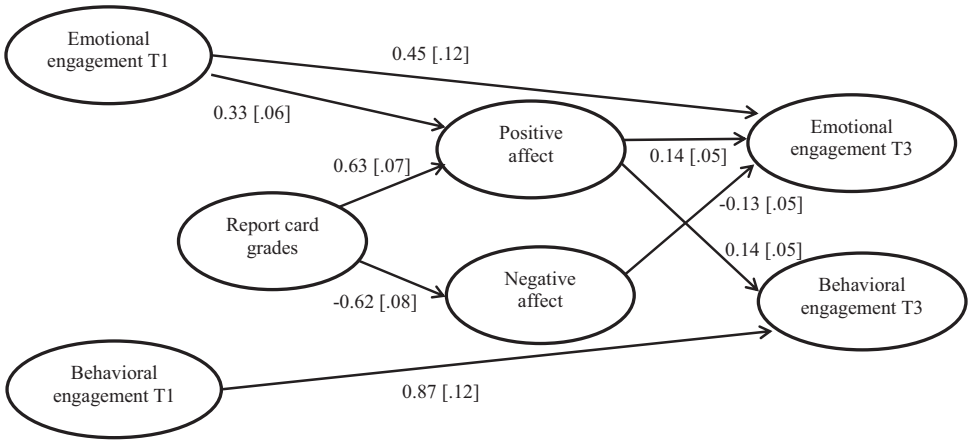


*Figure 2.* Path model for the effect of report card grades on emotional and behavioral engagement (Time 3) through positive and negative affect, controlled for prior levels of emotional and behavioral engagement (Time 1). Unstandardized coefficients are reported. Standard errors are in brackets. Only statistically significant path coefficients are shown (for all path coefficients, see Table 2). Dependent variables are allowed to correlate.

Table 2
*Path Coefficients for the Effect of Report Card Grades on Emotional and Behavioral Engagement (Time 3) Through Positive and Negative Affect (Time 2), Controlled for Prior Levels of Emotional and Behavioral Engagement (Time 1)*

| Variable | *b* | β | *SE* |
|---|---|---|---|
| Report card grades → Negative affect | −0.62*** | −.52 | .08 |
| Emotional engagement (T1) → Negative affect | −0.12 | −.10 | .06 |
| Report card grades → Positive affect | 0.63*** | .51 | .07 |
| Emotional engagement (T1) → Positive affect | 0.33*** | .27 | .06 |
| Report card grades → Emotional engagement (T3) | 0.02 | .02 | .08 |
| Positive affect → Emotional engagement (T3) | 0.14* | .18 | .05 |
| Negative affect → Emotional engagement (T3) | −0.13* | −.15 | .05 |
| Behavioral engagement (T1) → Emotional engagement (T3) | 0.06 | .06 | .11 |
| Emotional engagement (T1) → Emotional engagement (T3) | 0.45*** | .45 | .12 |
| Report card grades → Behavioral engagement (T3) | 0.05 | .04 | .09 |
| Positive affect → Behavioral engagement (T3) | 0.14** | .16 | .05 |
| Negative affect → Behavioral engagement (T3) | −0.01 | −.01 | .05 |
| Behavioral engagement (T1) → Behavioral engagement (T3) | 0.87*** | .79 | .12 |
| Emotional engagement (T1) → Behavioral engagement (T3) | −0.21 | −.19 | .12 |

*Note*. T1 = Time 1; T3 = Time 3.
* $p < .05$. ** $p < .01$. *** $p < .001$.

to obtain 95% confidence intervals for the size of the indirect effects for both positive and negative affect.

The indirect effects of report card grades via positive affect on both emotional engagement and behavioral engagement were significant (see Table 3). These findings confirm Hypothesis 2, showing that higher report card grades predicted higher positive affect, which subsequently predicted higher emotional and behavioral engagement. Furthermore, confirming Hypothesis 3, the indirect effect of report card grades via negative affect was significant for the outcome of emotional engagement. For the outcome of behavioral engagement, the effect was not significant (see Table 3). Thus, higher report card grades predicted lower negative affect, which subsequently predicted higher emotional engagement, but not behavioral engagement. When positive and negative affect were included in the model, the direct effects of grades on emotional and behavioral engagement became nonsignificant, suggesting full mediation.

## Moderated Mediation

Next, it was tested whether the links between grades and affective reactions were moderated by performance norms and gender, by including latent interaction terms in the model (Klein & Moosbrugger, 2000; Muthén & Muthén, 1998–2012). As recommended by Little (2013, p. 321), initially, gender and performance norms were tested as moderators of the link between grades and affective reactions in separate models. Next, all significant interaction effects were included in one model.

First, performance norms and the Report Card Grades × Performance Norms interaction were added to the model as predictors of negative affect and positive affect. Performance norms predicted neither negative affect, nor positive affect, $b = 0.86$, $SE = 1.03$, $p = .40$ and $b = -0.52$, $SE = 1.46$, $p = .72$, respectively. Consistent with Hypothesis 4, the Report Card Grades × Performance Norms interaction significantly predicted negative affect, $b = -1.26$, $SE = 0.48$, $p < .01$. A similar effect was, however, not found for positive affect, $b = 0.02$, $SE = 0.19$, $p = .93$. Simple slope analyses showed that the link between grades and negative affect was stronger for students who perceived performance norms in their class to be high (i.e., 1 *SD* above the mean), than for students who perceived performance norms in their class to be low (i.e., 1 *SD* below the mean), $b = -0.93$, $SE = 0.24$, $p < .001$ and $b = -0.22$, $SE = 0.14$, $p = .14$, respectively.

Table 3
*Effect of Report Card Grades on Behavioral and Emotional Engagement at Time 3 Through Positive and Negative Affect, Controlled for Engagement at Time 1*

| Variable | Unstandardized effect | Boot 95% confidence interval[a] |
|---|---|---|
| Grades → Positive affect → Emotional engagement | .09* | .02 to .18 |
| Grades → Positive affect → Behavioral engagement | .09* | .01 to .18 |
| Grades → Negative affect → Emotional engagement | .08* | .02 to .16 |
| Grades → Negative affect → Behavioral engagement | .00 | −.07 to .07 |
| Grades → Emotional engagement | .02 | −.17 to .20 |
| Grades → Behavioral engagement | .05 | −.15 to .24 |

[a] Bootstrap 95% confidence intervals are bias-corrected.
* $p < .05$.

Second, to explore gender differences, gender and the Report Card Grades × Gender interaction were added to the model as predictors of negative affect and positive affect. Gender predicted neither negative affect, nor positive affect, $b = -0.11$, $SE = 0.11$, $p = .31$ and $b = -0.11$, $SE = 0.11$, $p = .33$. The Report Card Grades × Gender interaction significantly predicted negative affect, but not positive affect, $b = 0.61$, $SE = 0.21$, $p < .01$ and $b = -0.03$, $SE = 0.12$, $p = .83$, respectively. Simple slopes analyses showed that the link between grades and negative affect was stronger for boys than for girls, $b = -1.00$, $SE = 0.19$, $p < .001$ and $b = -0.39$, $SE = .08$, $p < .001$,

Finally, a model was examined in which both interactions (Report Card Grades × Performance Norms and Report Card Grades × Gender) were included as predictors of negative affect. The main effects of performance norms and gender were also included as predictors of negative affect. Both interactions remained significant. See Figure 3 and Table 4 for the path coefficients of this final model.

To explore the effect of the moderators on the indirect effect of grades via negative affect on engagement (i.e., moderated mediation), the indirect effects were probed in a way analogous to standard moderation analyses. Using the moderator centering approach (Preacher et al., 2007), we computed the indirect effects of negative affect on emotional and behavioral engagement at two different levels of performance norms (i.e., 1 *SD* below the mean and 1 *SD* above the mean) and for boys and girls separately (see Table 5). Because bootstrapping is not available in Mplus when estimating latent interactions, normal 95% confidence intervals are reported.

Consistent with Hypothesis 4, the indirect effect of grades via negative affect on *emotional* engagement was stronger to the extent that students perceived performance norms in their class to be high. Also, this indirect effect of negative affect was stronger for boys than for girls, showing that boys reacted with stronger negative affect to their grades than girls. The indirect effect of grades via negative affect on *behavioral* engagement was not significant for any level of performance norms, neither for boy nor for girls. These analyses support the mediation analyses above, showing that the effect of report card grades on behavioral engagement is not mediated by negative affective reactions to those grades at any level of performance norms.

## Discussion

This study contributes to the literature on school engagement by elucidating the affective processes that help account for the effects of grades on engagement in a new school environment. Not only do the current findings replicate prior findings regarding declines in engagement after transitioning to secondary school (Eccles et al., 1993; Fredricks & Eccles, 2002), they also help us understand why some youth become behaviorally and emotionally disengaged. We showed that higher grades predicted increased emotional and behavioral engagement over time. Thus, the results of this study suggest that it is important to consider engagement as a response to performance feedback, not only as an antecedent of school performance (Fredricks et al., 2004; You & Sharkey, 2009). As far as we know, this study is the first to test mediation between grades and school engagement by examining affective reactions to report card grades.

The current study was designed to examine the ways in which the very first report card grades in secondary school shape students' school engagement during their first year in secondary school. Higher grades predicted increased emotional and behavioral engagement over time. Moreover, students' affective reac-

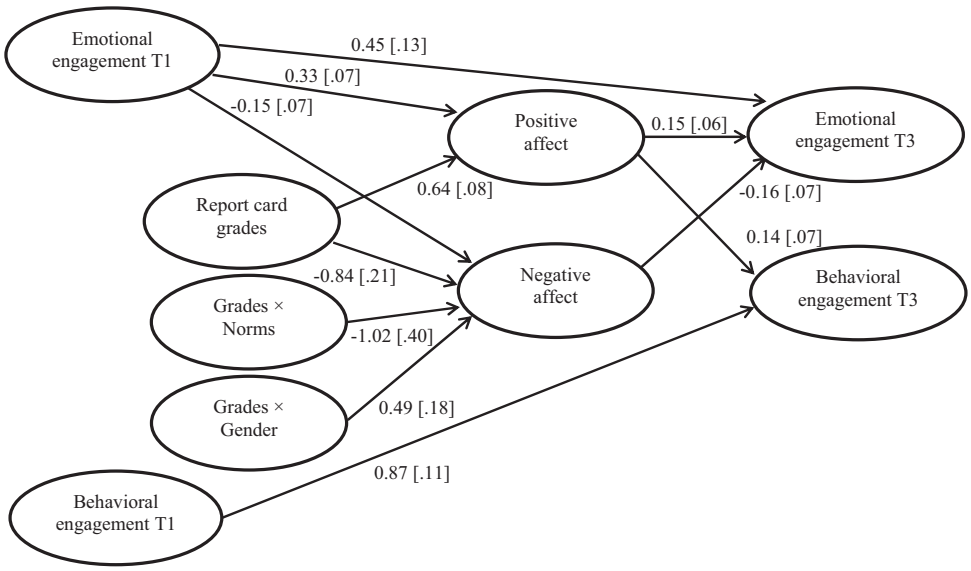


*Figure 3.* Path model for the effect of report card grades on emotional and behavioral engagement (Time 3) through positive and negative affect, controlled for prior levels of emotional and behavioral engagement (Time 1), moderated by performance norms and gender. Unstandardized coefficients are reported. Standard errors are in brackets. Only statistically significant path coefficients are shown (for all path coefficients, see Table 4).

Table 4
*Path Coefficients for the Effect of Report Card Grades on Emotional and Behavioral Engagement (Time 3) Through Positive and Negative Affect (Time 2), Controlled for Prior Levels of Emotional and Behavioral Engagement (Time 1), Moderated by Performance Norms and Gender*

| Variable | *b* | *SE* |
|---|---|---|
| Report card grades → Negative affect | −0.84*** | .21 |
| Performance norms → Negative affect | 1.37 | .86 |
| Gender → Negative affect | −0.13 | .11 |
| Grades × Performance norms → Negative affect | −1.02* | .40 |
| Grades × Gender → Negative affect | 0.49** | .18 |
| Emotional engagement (T1) → Negative affect | −0.15* | .07 |
| Report card grades → Positive affect | 0.64*** | .08 |
| Emotional engagement (T1) → Positive affect | 0.33*** | .07 |
| Report card grades → Emotional engagement (T3) | −0.02 | .10 |
| Positive affect → Emotional engagement (T3) | 0.15*** | .06 |
| Negative affect → Emotional engagement (T3) | −0.16*** | .07 |
| Behavioral engagement (T1) → Emotional engagement (T3) | 0.06 | .12 |
| Emotional engagement (T1) → Emotional engagement (T3) | 0.45*** | .13 |
| Report card grades → Behavioral engagement (T3) | 0.05 | .10 |
| Positive affect → Behavioral engagement (T3) | 0.14* | .07 |
| Negative affect → Behavioral engagement (T3) | −0.02 | .06 |
| Behavioral engagement (T1) → Behavioral engagement (T3) | 0.87*** | .11 |
| Emotional engagement (T1) → Behavioral engagement (T3) | −0.21 | .12 |

*Note*. T1 = Time 1; T3 = Time 3.
* $p < .05$. ** $p < .01$. *** $p < .001$.

tions to their grades mediated these effects, albeit in different ways for emotional and behavioral engagement. Whereas the link between grades and emotional engagement was mediated by both positive and negative affective processes, the link between grades and behavioral engagement was exclusively mediated by positive affect. Thus, students may come to act passively in the classroom, not so much because they experience strong negative feelings (e.g., distress, shame, anxiety), but rather because they experience reduced positive feelings (e.g., activation, inspiration, excitement).

An alternative explanation for the nonsignificant link between negative affect and behavioral engagement is that two countervailing effects may be working simultaneously: Prior research shows that activating negative emotions has detrimental effects on behavioral engagement for some individuals but positive effects for others (e.g., Martin, 2011; Turner & Schallert, 2001). Pekrun et al. (2002, 2011) argued that whereas deactivating or inhibiting negative emotions (e.g., hopelessness or boredom) have universal detrimental effects on students' engagement, activating negative emotions can have variable effects on students' engagement because they elicit mixed motivational responses. Empirically, they found that anxiety and shame were linked to decreased intrinsic motivation (i.e., motivation to learn because the learning is enjoyable) but increased extrinsic motivation (i.e., motivation to learn to attain outcomes such as high grades; Pekrun et al., 2011). The joint effects of these different motivational responses may determine whether students who experience negative affective reactions to their grades will invest increased effort to avoid future failure or instead disengage from their school work. Thus, it may well be that these two competing motivational forces that both stem from negative affect may have increased engagement in some students but decreased engagement in others, thus canceling out a main effect in our analyses.

Affective reactions and their possible effects on engagement do not take place in a social vacuum, however. We found that the link

Table 5
*Indirect Effects of Report Card Grades on Emotional and Behavioral Engagement (Time 3) Through Negative Affect at Different Levels of Performance Norms, Controlled for Engagement at Time 1*

| Variable | Indirect effect boys | 95% confidence interval | Indirect effect girls | 95% confidence interval |
|---|---|---|---|---|
| Grades → Negative affect → Emotional engagement | | | | |
| Low performance norms | 0.09* | 0.002 to 0.17 | 0.01 | −0.04 to 0.06 |
| High performance norms | 0.18* | 0.03 to 0.34 | 0.11* | 0.01 to 0.20 |
| Grades → Negative affect → Behavioral engagement | | | | |
| Low performance norms | 0.01 | −0.05 to 0.07 | 0.00 | −0.01 to 0.01 |
| High performance norms | 0.02 | −0.11 to 0.16 | 0.01 | −0.06 to 0.09 |

*Note*. Low performance norms are one *SD* below the mean. High performance norms are one *SD* above the mean. Indirect effects are based on unstandardized coefficients.
* $p < .05$.

between grades, negative affect, and subsequent emotional school engagement was stronger for students who perceived their classmates to obtain high grades. Students perceiving high performance norms experienced relatively high levels of negative affect when faced with low grades, and relatively low levels of negative affect when faced with high grades. Students are likely to compare their grades to the grades of their classmates (Pulfrey et al., 2011; Trautwein et al., 2006). Adolescents who feel that the classroom norms for performance are high may come to attach more importance to their own performance, resulting in stronger negative affective reactivity to their report card.

We also explored and found gender differences highlighting the role of negative affective reactions among boys. Boys' negative affective reactivity to grades was stronger than girls', which resulted in stronger effects of grades on boys' emotional engagement via negative affect. Although in many situations boys are somewhat less emotionally reactive than girls (e.g., Charbonneau et al., 2009; Rudolph, 2002), our results suggest this is not the case in the specific context of receiving grades. Grades encourage social comparison and highlight students' normative standing in the peer group (Pulfrey et al., 2011). It may be the competitive nature of grades that makes boys more reactive to them (e.g., Hibbard & Buhrmester, 2010). Because adolescent boys on average obtain lower grades than girls (e.g., Lam et al., 2012) and experience relatively strong negative affect in response to those grades, they are especially vulnerable to declines in emotional engagement.

The strengths of the present study include the measurement of school engagement at different time points. This allowed testing of the effects of grades and students' affective reactions on school engagement, while controlling for prior levels of school engagement, thus providing insight in whether grades and affective reactions can predict changes in engagement over and above rank order stability. Furthermore, the study was designed to test these effects at a critical time period: shortly after the secondary school transition, when many students show a decline in school engagement (Eccles et al., 1993). Finally, we considered the larger social context in which students react to their grades by examining perceptions of classmates' grades. Rather than asking students what the typical grades are among their classmates, we obtained a more informed measure by relying on aggregates of how students' believe each of their classmates perform. In spite of these strengths, a number of limitations should be noted.

First, we assessed the rather broad dimensions of positive and negative affect, not discrete emotions (e.g., shame, anxiety, guilt, and anger). It is possible that discrete negative emotions lead to different patterns of engagement (Pekrun et al., 2011). For example, guilt is theorized to arise in response to controllable causes of failure and to increase engagement (Weiner, 1985, 2010). In contrast, shame is theorized to arise in response to uncontrollable causes of failure and to induce decreases in engagement (Weiner, 1985, 2010). Although in our sample shame and guilt were strongly correlated ($r = .73$), future research might benefit from assessing discrete achievement emotions and examining their differential effects on engagement (e.g., see Pekrun et al., 2011).

Second, we chose to focus on affective reactions as a mediating mechanism. Of course, this is not to say that other mediating mechanisms are unimportant. For example, low grades also induce lower expectancies of subsequent performance, which have been shown to be related to lower persistence and interest (e.g., Denissen et al., 2007; Wigfield & Eccles, 2000; Wigfield, Tonks, & Klauda, 2009). Future research could test various putative mediating mechanisms in the same study to compare their relative strength.

Third, we measured report card grades, which provide an overall summery of students' performance in the preceding period. Receiving a report card is a highly salient event for many students and their parents, in part because academic decisions (e.g., retaining a grade) are based on these grades. Still, students already receive performance feedback on exams and assignments prior to their report card, which potentially affects their school engagement even earlier in the school year. Future research is needed to establish whether report card grades or grades and performance feedback on individual assignments and exams may be more important for changes in school engagement.

Fourth, consistent with most other studies on school engagement, we measured behavioral and emotional engagement as general constructs and did not differentiate between school subjects (for a review on engagement measures, see Fredricks & McColskey, 2012). Assessing school engagement separately for different subjects may be an important direction for future research to determine to what extent children's emotional and behavioral engagement are domain-specific and to what extent they represent a general tendency (e.g., Eccles & Wang, 2012; Fredricks & McColskey, 2012).

Fifth, although the intervals between the measurement occasions in our study were relatively short when compared to most longitudinal studies (i.e., 3-monthly, rather than half-yearly or yearly), a longitudinal design with even shorter time intervals might have permitted us to capture the change processes in more detail (Collins, 2006). Theoretically, an immediate effect of students' affective reactions to grades on their levels of school engagement may be expected (Pekrun, 2006). We measured school engagement 3 months later—a period during which other events influencing engagement may have occurred. Future research using more intensive repeated measure designs, such as experience sampling designs (Bolger, Davis, & Rafaeli, 2003) is needed to test fine-grained changes in engagement in response to obtaining grades. In addition, future research could benefit from using a full longitudinal design measuring grades, affect, and engagement at each time point. Such a design takes the stability of each of these construct into account and provides more insight in the causal ordering of the processes than the current design (Mitchell & Maxwell, 2013).

## Conclusions

In many schools, giving grades is a daily routine, yet teachers may not always be fully aware of the possible emotional and behavioral consequences of the grades they provide. This study suggests that low grades may set in motion a downward spiral, whereby consequent declines in engagement result in even lower grades. Low-performing students who perceive their classmates to receive high grades are particularly vulnerable. Also, boys are vulnerable for declines in engagement because they tend to receive lower grades and are more affectively reactive to grades than girls. We do not suggest that the common practice to evaluate schoolwork with grades should be abandoned. Grades can provide vital information to teachers, students, and parents and can be used to enhance both teaching and learning (Guskey & Bailey, 2001). Additionally, students who perform well at

the start of secondary school are likely to be more involved in their schoolwork during the school year. However, teachers should be aware of the potential negative consequences of the grades they give and try to reduce these. For example, prior research suggests that negative effects of grades may be prevented when teachers convey the message to their low-performing students that their difficulties are likely to be temporary and that when they exert more effort and use the right strategies they will be able to perform better (e.g., Robertson, 2000; Yeager & Walton, 2011). Making a good start after the school transition may be vital for success in secondary school.

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## Appendix

### Model Fits for Models With Behavioral and Emotional Engagement at Time 1 and Time 3 Testing for Strict Factorial Invariance

| Model | $\chi^2$ | *df* | *p* | CFI | ΔCFI | RMSEA | 90% CI RMSEA |
|---|---|---|---|---|---|---|---|
| Unconstrained | 117.9 | 42 | <.001 | .968 | | .064 | .051; .078 |
| Weak invariance | 120.7 | 46 | <.001 | .968 | .000 | .061 | .048; .074 |
| Strong invariance | 139.6 | 50 | <.001 | .962 | .006 | .064 | .052; .077 |
| Strict invariance | 146.9 | 56 | <.001 | .962 | .000 | .061 | .049; .073 |

*Note.* CFI = comparative fit index; RMSEA = root-mean-square error of approximation; CI = confidence interval.

Received September 16, 2013
Revision received July 5, 2014
Accepted July 11, 2014 ■